

THE HUMAN FOSSIL RECORD, VOLUME FOUR: CRANIODENTAL MORPHOLOGY OF EARLY HOMINID (GENERA *AUSTRALOPITHECUS*, *PARANTHROPUS*, *ORRORIN*), AND OVERVIEW. By Jeffrey H. Schwartz and Ian Tattersall. Hoboken, NJ: John Wiley & Sons, Inc. 2005. 561 pp. ISBN 0-471-31929-5. \$195.00 (cloth).

Since the 1924 discovery of the Taung skull, a wealth of fossils has been recovered documenting the early evolution of the human lineage in Africa. Whatever a researcher's hypotheses or conclusions, ultimately the science is about these fossils. And over the last 80+ years, there have been more fossils found documenting human evolution than most people can any longer reasonably set to memory. Therefore, a book that compiles photographs and information about every published pre-*Homo* African hominid fossil would be extremely useful to all hominid paleontologists.

With this thought in mind, I eagerly broke the spine on *The Human Fossil Record Volume 4: Craniodental Morphology of Early Hominids (Genera Australopithecus, Paranthropus, Orrorin), and Overview*. As most readers are aware, this volume follows in a series of three other monographic treatments of hominid fossils: *Volume 1, Terminology and Craniodental Morphology of Genus Homo (Europe)*; *Volume 2, Craniodental Morphology of Genus Homo (Africa and Asia)*; and *Volume 3, Brain Endocasts—The Paleoneurological Evidence*. The first two volumes are by the same authors as *Volume 4*, Jeffrey H. Schwartz and Ian Tattersall.

These previous two volumes were extensively reviewed, which is not surprising, given the importance of the undertaking and the significant resources these volumes promised to become, and they met many criticisms. Perhaps the most salient involved the lack of metric data, the poor quality of many of the photographs, and the lack of consistent description (for example, Prof. Bernard Wood noted that early *Homo* teeth from Koobi Fora described as "tiny" were actually the same size as teeth called "huge").

Aware of the past reviews and the presumed desire of the authors to produce a tome that every primate paleontologist would want to buy, I read *Volume 4* hoping to see evolution. Would this incarnation be better adapted to local conditions? Had reviewer-selection driven the authors to retain the lauded features and mutate the less desired traits? *Volume 4* demonstrates that in this instance, reviewer-selection has proven weak, with the rate of evolution correspondingly slow. Indeed, a sort of literary Hardy-Weinberg equilibrium exists.

Practicing paleontologists routinely rely on monographic treatments of fossils in their comparative work. For me, three sources of information are critical: metric data, excellent photographs, and accurate and informative written descriptions. I will address each of these aspects in Schwartz and Tattersall's *Volume 4*.

There are no metric data in this book. None, period. No kidding. The authors hope that readers will not be too disappointed (see the Preface), and explain that these data are available in the primary literature (thankfully). The authors justify the omission of metric data by asserting that these would distract from the fine aspects of morphol-

ogy. As reviewers of the previous volumes noted, it is difficult to take this claim seriously.

Metric data were also ostensibly left out of these volumes to conserve space (explanation in the Preface). Elimination of metric data in *Volume 4* created space for 50 pages dedicated to the authors' personal views on hominid evolution, followed by 38 pages of plates, often with rather odd comparisons of fossils pictured elsewhere in the book (for example, the internal view of the Belohdelie frontal next to an external view of the reconstruction of the Hadar AL 444-2 skull, p. 535). Furthermore, readers might justifiably wonder why 24 pages of text and 12 plates in the overview section were dedicated to the genus *Homo*, which is not the focus of this book (and was covered in other volumes).

Most of the photographs lack adequate depth of field. Consequently, morphology is difficult to observe. The photographs are usually "soft" or completely out of focus (e.g., pp. 86, 94, 98, 103, 106, 175–176, 180, 192–193, 206, 273, 284, 418, 443 (Taung's facial view), 519, 523, and others), and lack adequate contrast or appropriate lighting to highlight morphological detail. Almost all photographs lack figure legends describing the orientation of the specimen. This is often not a problem, since most of the consumers of such a book are versed in skeletal anatomy, but this oversight will make the book quite difficult for the student or novice to use. However, a more critical point is that several photographs in the overview section (particularly those used to bolster the authors' comparative arguments) are intentionally not to scale (e.g., p. 535). And here, size does matter; after all, compared without a scale, hyrax and rhinoceros teeth are similar. Given the access to reasonably priced high-quality digital photography equipment and the image manipulation software that has been available for years, the figures are of surprisingly poor quality.

Aside from these two points, perhaps the most frustrating part of this book is the authors' insistence on categorizing hominid fossils into "morphs." This imposes a confusing organization on each chapter, making it difficult to find a particular specimen, especially since the volume lacks an index. For example, the authors recognize four different morphs within the Allia Bay hominids, a sample that comprises only 31 mostly isolated dental specimens. Even more astonishing are the five morphs (including a "Pongo-like" one) for the 47 Kanapoi specimens (again, mostly isolated teeth or tooth fragments). Schwartz and Tattersall must have had some problems with these five morphs themselves, though, since they created a sixth Kanapoi "unassignable to morph" category. One wonders how many of the six will be used by Hennigians as operational taxonomic units to embellish already bushy cladograms. Undeterred by such concerns, the authors recognize three different morphs *within* the AL333 sample. It would have been more straightforward to describe the fossils in numerical order by site, and more in line with the authors' stated intention to provide a useful reference tool (see the Preface).

This series of volumes provided a unique opportunity to offer a true service to paleontology. However, Schwartz and Tattersall's oft-stated conviction that there exists more species diversity in the fossil record than is widely

accepted detracts from the value of this series. And their snide comments insulting various researchers (see the Preface) give this volume a political tone.

In the long run, every fossil contributes more information about our evolutionary history than any one person's interpretations or conclusions. Schwartz and Tattersall make this point nobly in the volume's coda. As such, a compendium devoid of politics and agendas, but rich with attention to quality and detail, would have been a true contribution to the discipline.

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**MACAQUE SOCIETIES: A MODEL FOR THE STUDY OF SOCIAL ORGANIZATION.** Edited by Bernard Thierry, Mewa Singh, and Werner Kaumanns. New York: Cambridge University Press. 2004. 418 pp. ISBN 0-521-81847-8. \$120.00 (cloth).

Macaques have been the subjects of extensive research both in the wild and in captivity for over six decades. Because there is such an extensive body of literature on these monkeys and because this literature is often published in journals from a variety of different fields, it is difficult for physical anthropologists who do not study macaques to keep abreast of the advances in understanding macaque societies. This 15-chapter volume by Thierry, Singh, and Kaumanns provides a valuable service to the field by summarizing what is currently known.

The volume is divided into five parts, bounded by introductory and concluding chapters. Each chapter body is followed by a "box," which is a short examination of a related topic by a different author. The editors introduce the book with a self-authored chapter that provides a brief overview of the factors that are important in primate social evolution, the history of research on macaques, and what is known about the genus. They rightly assert that the wealth of information available on macaque behavior and biology allows for an excellent examination of the forces that shape primate social organizations.

Macaque societies are known for exhibiting variation in social styles. Part I of the book focuses on individual attributes as possible sources for these differences. Chapters 2 and 3 suggest that personality (Capitano) and emotions (Aureli and Schino) may be key factors. Many physical anthropologists are not familiar with these bodies of literature, and so they provide a useful review of the relevant conceptual frameworks as well as some empirical evidence for how selection might act upon personality traits and emotional states. Chapter 4 (Bercovitch and Harvey) is a review of the vast literature on macaque reproductive life histories, and is full of data.

In Part II, Chapter 5 reviews the role of demography in social evolution in toque macaques (Dittus). Chapter 6 (Gachot-Neveu and Ménard) provides a discussion of the often overlooked (in primatology as a whole) influences of microevolution on macaque social organization. Chapter 7 (Soltis) surveys male and female reproductive strategies, explores the controversies regarding rank and reproductive success, and highlights the lack of systematic classification of male dominance styles.

Part III focuses on social relationships and social structure. Chapter 8 (Flack and de Waal) is a theoretical exploration of dominance styles and political systems in macaques. Flack and de Waal provide an interesting and elaborate interdisciplinary framework for studying the

emergent properties of social groups. However, in building their framework of polyadic power (where individuals are in agreement about the authority of fellow group mates), they ask the reader to throw out the advances of the past two decades that have expanded power to include leverage, without providing any reason for why we should be willing to do so. In Chapter 9, Chapais looks at female-female relationships and suggests that responses to the strength of competition are continuous rather than discrete, and depend on the profitability of kin support. Chapter 10 (Chauvin and Berman) is a survey of possible behaviors that are socially transmitted across generations.

Part IV takes a step back and looks at broader explanations for the observed variation in macaque societies. While the ecological model of female-female relationships has been discussed throughout the book, Chapter 11 (Ménard) attempts to test the model but ultimately demonstrates the paucity of data on macaque habitat use. In Chapter 12, Thierry urges primatologists to focus more on the interdependence of characteristics and the evolution of emergent properties that may constrain social evolution. The last chapter in this section, Chapter 13, is another wonderful example of Hemlerijk creating a society of virtual monkeys that with a few simple rules develops many of the same characteristics of real monkey societies. She finds the most important source of interspecific variation in macaque societies to be the intensity of aggression. While she uses the results to downplay the importance of ecology in macaque social variation, ecology may be the basis for the variation in group cohesion and aggression. Nevertheless, this chapter is a sober reminder of how apparently complex phenomena can arise out of simple rules of thumb.

The book ends with a social anthropologist's impressions of macaque societies (Chapter 14). Godelier provides an outside view and some much-needed discourse across anthropological subfields. The editors' concluding remarks (Chapter 15) help the reader weave the connections between the sometimes seemingly unrelated chapters and boxes.

Most of the boxes provide brief summaries of information on a particular topic that is at least tangentially related to its companion chapter. A few provide new empirical tests of hypotheses. For example, Paul presents a comparative test of the importance of dominance in male reproductive success. Singh and Sinha show that the sources of life-history variation described in Chapter 4 support the ecological adaptations hypothesis over phylogenetic constraints. Cooper summarizes the data on between-group encounters and finds that they do not necessarily support the hypothesis that high intergroup competition leads to more tolerant societies. The box format does not